

Department of the Army
Headquarters, U.S. Army
Industrial Operations Command
Rock Island, Illinois 61299-6000

*IOCR 5-1

7 SEP 1995

Management: Work Measurement

WORK MEASUREMENT PROGRAMS

Applicability. This regulation applies to Headquarters, U.S. Army Industrial Operations Command, (HQ, IOC) and to all active IOC Government-owned, contractor-operated (GOCO) plants except those operating under a fixed-price contract. (The total plant must be operating under a fixed price contract to be excluded.) Applicability to inactive facilities will be governed by the contract clause at Appendix A, which is to be included in all GOCO contracts which do not have required work measurement programs. The provisions of this regulation are outside the scope of DOD 5010.31, which applies to Government organizations and activities.

Decentralized printing. All IOC installations are authorized to locally reproduce this regulation.

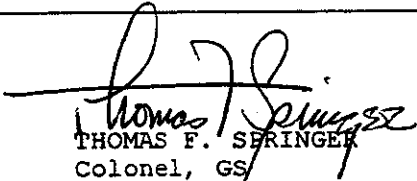
Supplementation. Supplementation of this regulation requires prior permission from HQ, IOC, AMSIO-RMP, Rock Island, IL 61299-6000.

Suggested improvements. The proponent of this regulation is the HQ, IOC Program Management and Analysis Division. Users are invited to send comments and suggested improvements to Commander, IOC, ATTN: AMSIO-RMP, Rock Island, IL 61299-6000.

Distribution. Distribution of this regulation is made IAW requirements submitted by the proponent (stocked/issued by Rock Island Arsenal, ATTN: SAI-PSP).

FOR THE COMMANDER:

Official:


THOMAS F. SPRINGER
Colonel, GS
Chief of Staff

<u>Contents</u>	<u>Paragraph</u>
Purpose -----	1
Acronyms/Terms -----	2
Responsibilities -----	3
Policies -----	4
Procedures -----	5
Appendix A. Contract Clause	
Appendix B. Review of Work Measurement Program	

*This regulation supersedes AMCCOMR 5-3, 17 Apr 90.

7 SEP 1995

1. Purpose. This regulation prescribes policies, responsibilities, and procedures for development, maintenance, utilization, and reporting of work measurement standards for contractors of GOCO Army Ammunition Plants (AAPs) of the HQ, IOC.

a. Objectives. The objectives of the Work Measurement Program for HQ, IOC plant operations are to:

(1) Promote increased productivity and economy in the use of facilities, manpower, and equipment.

(2) Provide current and reliable work measurement data and indexes with which:

(a) Staffing requirements for current and projected workloads can be determined.

(b) Work can be scheduled and controlled.

(c) Resource requirements can be forecasted and controlled.

(d) Cost estimates can be prepared.

(e) Performance efficiency can be evaluated.

2. Acronyms/Terms.

a. Allowance. A coefficient based on authorized nonproductive time for Personal, Fatigue, and Delay (PF&D) that is applied to productive time resulting in the total allowed time to perform productive work.

b. COR. Contracting Officer's Representative.

c. GOCO. Government-owned, contractor-operated.

d. Group Timing Technique (GTT). A work measurement procedure for several activities that allows an observer using a stopwatch to make a detailed elemental time study covering from two to fifteen workers or machines at the same time.

e. Hour.

(1) Actual hours. All labor hours actually taken to complete a specific number of work units.

(2) Earned hours. Labor hours credited. Calculated by multiplying the standard time per work unit by the number of work units completed to yield the labor hours credited to worker(s)/organization(s).

(3) Measured hours. Actual labor hours worked on tasks for which a standard has been established.

(4) Standard hour. An hour of time during which a specified amount of work can be performed. One (1) hour of allowed time (standard time) for a given operation in which the work output is of acceptable quality, performed by a qualified worker, who follows a prescribed method, and works at a normal

7 SEP 1995

IOCR 5-1

pace, under normal working conditions, and who experiences normal fatigue and delay.

f. Normal time. The selected average element/motion time adjusted by rating (leveling), but not allowances. The time required by an average qualified worker to perform a single element/motion of an operation while working at a normal pace (as described in the definition of standard time for the work measurement program).

g. Percent coverage. A ratio of actual hours worked against standards (measured hours) divided by total hours worked in a department, work center, etc., expressed as a percentage.

h. Performance. A worker who uses his/her skill and the effort (pace and degree of concentration) applied to an operation under prevailing conditions.

(1) Actual performance. Where a standard has been set, actual performance can be expected to vary according to the data and confidence level established.

(2) Performance efficiency. A ratio of standard earned hours (should take time) to measured hours (did take time) usually expressed as a percentage (earned hours divided by measured hours multiplied by 100).

(3) Performance goal. Defined established outcome(s) which is/are to be met or exceeded by an organization.

i. Predetermined time system. A framework of information, procedures and techniques employed in the study and evaluation of manual work elements. The system is stated in terms of motions used, their general and specific nature, the conditions under which they occur, and their previously determined performance times.

j. Standard time data. A compilation of all the elements involved in performing a given class of work with normal elemental time values for each element. The data is utilized to determine time standards on similar work.

k. Time formula. A formula for determining the normal time or standard time of a task as a function of one or more variables in the task. Included are coefficients for the variables so that insertion of the variable values allows direct time computation.

l. Time standards. A unit of time value for the accomplishment of a work task as determined by the proper application of appropriate work measurement techniques. Generally, a time standard is established by applying appropriate allowances to normal time. The types of time standards are engineered time standard, engineered maintenance standard, statistical time standard, technical estimate, staffing pattern, and man-hour allowance.

(1) Engineered time standard. The time (man-hours) it should take a trained worker or a group of trained workers, working at a normal pace, to produce a described unit of work of an acceptable quality according to a specified method under specific working conditions. It is derived from a complete, objective analysis and measurement of the task. An engineered time standard is developed through the use of techniques, such as, time study, predetermined time systems, standard time data, rated work sampling, or any combination of these techniques that will give a comparable level of accuracy.

7 SEP 1995

A time standard is classified as an engineered standard if 90 percent or more of the total normal time was developed through the use of any of the above mentioned qualifying techniques. The statistical criteria for an engineered time standard consist of a reliability ± 10 percent and a confidence level of 90 percent. The engineered time standards requires the following supporting documents:

(a) A record of the standard practice or method followed when the engineered standard was developed. This should contain specific statements describing the work situation and method which provides the basis for the standard time and also clearly identifies the work unit measured.

(b) A record of the observed or synthesized time values used in determining the final standard time. These time values may have been derived from stopwatch study, predetermined time systems, film analysis, work sampling study, Group Timing Technique (GTT), or standard data tables.

(c) A record of computations used to determine the statistical reliability of the standard and a statement of the statistical reliability.

(d) A record of the rating or leveling observed during performance when the time values were recorded. This is basically a comparison of observed operator pace compared to the analyst's concept of normal as described in the definition of standard time.

(e) An explanation of what allowances were used in the final computation of standard time.

(f) A record of how the standard time was computed, showing each computation step-by-step.

(g) Documentation of the methods study performed prior to measurement.

(h) A concise statement of job skill level requirements.

(i) The date the standard was established and reviewed/revised.

(2) Engineered maintenance (facility) standard. A standard set that includes 75 percent or more of the total normal time which was developed through the use of any of the above stated techniques and pertains to real property, i.e., roads, grounds, and buildings.

(3) Statistical/time standard. A standard time developed from statistical analysis of past performance data expressed as man-hours per work unit. Include standards computed by using one or more of the techniques of work measurement.

(4) Technical estimate. A determination of the standard hours required for a given task, based on an estimate made by an individual technically and professionally competent to judge the time required.

(5) Staffing pattern.

(a) A staffing pattern accounts for hours worked on jobs that are not governed by rate of production of man-hour expenditures. It is a type of standard to provide reasonable control over operations that are governed by

7 SEP 1995

IOCR 5-1

directives, technical manuals, imposed requirements, etc.; operations that are uneconomical to measure or extremely difficult or nearly impossible to measure.

(b) When a detailed study using industry acceptable work measurement techniques fails to uncover an identifiable work unit, results in a standard with questionable reliability, or is determined to be economically infeasible to develop, the operation is a prime candidate for a staffing pattern.

(c) Some examples of types and categories of personnel usually coming under staffing patterns are personnel staffed to maintain minimum required activities (for example, plant manager and division heads); personnel staffed to meet the requirements of Army regulations or technical manuals (for example, guards, firemen, and nurses), and directed requirements (the requirements must be in writing), such as, supervisors based on supervisor/worker ratio, personnel required for a given area due to safety or security requirements, or an operation requiring the physical presence of an individual although the workload content of the operation is not sufficient to support the need for an operator.

(d) Justification for a staffing pattern is required by a detailed study and/or the documented reasons for the inability to adequately define a work unit, technical manuals, and Army regulations or other directed requirements.

(6) Man-hour allowance. Man-hours worked for which no type of measurement exists. One (1) man-hour allowance is equivalent to one (1) person working for one (1) hour. Man-hour allowances pertain to those jobs or positions for which no study or analysis has been performed. An example of man-hour allowance is an operation with a life expectancy of less than 30 calendar days, intermittent or continuous, with little or no chance for the operation to be repeated in the future.

m. Time study. The procedure by which the actual elapsed time for performing an operation is captured by the use of a stopwatch and recorded.

n. Work sampling study. A statistical sampling technique used to investigate the proportion of total time dedicated to the various activities that comprise a job or work situation. Work sampling can be utilized to determine PF&D allowances, machine and personnel utilization, and establishing time standards.

o. White collar productivity measurement system. An independent system that determines productivity through variations in ratios of outputs to inputs during and subsequent to a baseline period. The computerized system should provide a quantitative statistical analysis of white collar productivity. The system should produce data pertaining to an organization's personnel, activities and associated work units/services, the management of labor standards and productivity, and statistical process control.

p. Work unit. A countable and tangible expression of work output or performance which can be identified, adequately described, and which expresses quantitatively the work accomplished in a work area.

7 SEP 1995

3. Responsibilities.

a. The Program Management and Analysis Division (AMSIO-RMP), HQ, IOC, will:

(1) Develop the Work Measurement Scopes of Work (SOW) for contractor activities in GOCO plants.

(2) Conduct periodic on-site reviews to augment the Contracting Officers Representative's (COR) review, evaluation, and monitoring of the contractor's Work Measurement Program. Results of on-site reviews will be provided to the Contracting Officer for use in negotiation. On-site work measurement reviews will be conducted at least once every 2 years by AMSIO-RMP or when requested by the installation.

(3) Provide an independent review and analysis of each contractor's Work Measurement Program through an industrial management review team to ensure provision of assistance and/or corrective action, if required.

b. The Deputy Chief of Staff for Acquisition and Principle Assistant Responsible for Contracting (AMSIO-AC), HQ, IOC, will:

(1) Incorporate in each active plant contract (except fixed-price contracts) a requirement for the contractor to establish, implement, maintain, and use a suitable Work Measurement Program covering all functional areas of the contractor's operation IAW the guidance contained in this regulation.

(2) Ensure that necessary advice, technical assistance, and direction pertaining to the Work Measurement Program are provided to the contractor.

c. The Ammunition Production and Logistics Division (AMSIO-IOA), HQ, IOC, will, on a commodity item or plant basis, make inspections, evaluate production performance, and identify areas for improvement to increase efficiency and reduce production costs.

d. The COR at GOCO plants will review and evaluate all new or revised standards set by the contractor, except for maintenance standards which will be reviewed on a sampling basis. New or revised standards may be implemented prior to the COR review. The COR will also review the total Work Measurement Program, including the "work measurement coverage plan", IAW the guidance in this regulation. AMSIO-RMP, HQ, IOC, will assist in these efforts when required; such as, the COR's area of expertise is not in work measurement and the COR lacks the appropriate number of support personnel trained in work measurement to adequately review and evaluate standards. (Refer to Appendix B.)

4. Policies.

a. Establish, implement, maintain, and utilize appropriate standards to achieve optimum productivity of contractor personnel employed in the HQ, IOC GOCO plants. These standards will be established in all of the contractor's functional areas. Methods studies will be performed prior to developing an engineered time standard and to improve established time standards. Standards should be reviewed and updated by the contractor periodically for high volume and/or high value workload to maintain their validity. Standards should be reviewed and updated by the contractor when changes occur to methods,

7 SEP 1995

IOCR 5-1

procedures, tools, fixtures, jigs, workplace or work layout, specified materials, work content of the job, etc..

b. Industry-accepted industrial engineering work measurement techniques will be used to improve work methods, establish performance standards, and measure the efficiency with which work is performed and resources are applied. Performance data obtained from the Work Measurement Standards Program will be capable of summarization for use in costing, planning and scheduling, controlling personnel labor utilization, and determining manpower, equipment, facilities and material requirements.

c. Engineered time standards will be developed and used to the maximum extent practical. For those work functions not deemed practical/economical, the contractor shall provide sufficient justification for nonapplication.

d. For control purposes, an efficiency range of 90 percent to 110 percent against time standards is established as an acceptable tolerance of engineered standards, and 80 percent to 120 percent for engineered maintenance (facility) standards. Time standards with consistent out-of-tolerance performance efficiencies should be reviewed in a timely manner for high volume and/or high value workload.

e. The method of measuring work will be developed in such a manner as to permit performance efficiency data to be summarized by area/department craft and consolidated to produce a ratio of performance efficiency for the entire plant.

f. Performance-time standards and internal control systems will be designed so as to facilitate their maximum use by operating officials in the day-to-day accomplishment of their assigned operations. The contractor is required to maintain a labor and production reporting system to allow the contractor to monitor and determine the accuracy of productivity reporting. Also, the labor and production system will provide an audit trail for labor hours and workload reporting.

5. Procedures.

a. Cost Trade-off Analysis. The upgrade of the work measurement coverage plan, developed by the contractor, shall be based on cost trade-off analyses which consider the status and effectiveness of the existing Work Measurement Program.

b. When considering the type of standard to be set, the following techniques should be used in the listed, preferred order:

(1) Engineered standard set by one or more of the following techniques.

- (a) Standard time data.
- (b) Predetermined time systems.
- (c) Time study.
- (d) Work sampling study.
- (e) GTT.

7 SEP 1995

- (2) Statistical standard.
- (3) Technical estimate.
- (4) Staffing pattern.
- (5) Man-hour allowance.

c. Computerized work measurement systems should be used to the maximum extent possible to reduce the ratio of work measurement staff man-hours to engineered hours.

d. White collar productivity measurement system.

7 SEP 1995

IOCR 5-1

Appendix A

CONTRACT CLAUSE

1. The Contractor shall establish, implement, and maintain up-to-date work measurement standards IAW with IOCR 5-1 pertaining to each employee or group of employees assigned to the plant.
2. Formal reporting of Work Measurement Programs will not be required. However, Work Measurement Programs must be up-to-date and available for Government's review.
3. Upon termination of the production aspects of this contract and/or inactivation of the facility, the requirements for continued use of a formal Work Measurement Program are rescinded, except in plant maintenance operations. At the time of production cessation/inactivation, the contractor will fully document the Work Measurement Program to ensure that when the facility commences/reactivates production, the Work Measurement Program can be totally reinstated with minimal cost to the Government. The contractor shall continue to develop and use work measurement standards for the maintenance programs remaining.

7 SEP 1995

Appendix B

REVIEW OF WORK MEASUREMENT PROGRAM

1. A Work Measurement Program Review includes determining:
 - a. Are methods and procedures used in establishing work measurement standards adequate to ensure valid standards?
 - b. Are the internal controls in the system's data-gathering process adequate to obtain valid input data?
 - c. Is the processing, manipulating, and reporting of work measurement data sufficiently controlled to provide valid output?
 - d. Does the system produce meaningful, timely reports which are used by management to measure performance and make decisions?
 - e. Are the input work unit counts as automated as possible, as opposed to manual counts, particularly by the individual whose performance is being measured?
 - f. Does a training program or procedure exist for informing work center supervisors and employees of the purpose for setting and using standards?
 - g. Has the method been adequately considered by formal methods study prior to setting the standard, or by sufficient elements in the standard that will specify the method used?
 - h. Is the procedure for reevaluation of standards being followed? Test a representative number of standards within selected work centers. Trace the history of changes to standards and the reasons for such changes for those standards selected.
 - i. Is the program accomplishing its intended goals of reducing cost and increasing productivity?
 - j. Does a productivity efficiency report exist?
 - k. Is the efficiency report being used?
 - l. Is maintenance backlog being monitored and is appropriate action on the backlog being taken? (What caused the backlog? How much backlog? Is there any overtime resulting from the backlog? How much overtime? What can be done to prevent the backlog from occurring in the future? How does the backlog affect the operation(s) and resources?)
 - m. Are department or cost area efficiencies within the range of 90 to 110 percent for engineered time standards and 80 to 120 percent for engineered maintenance standards?
 - n. Are performance-time standards and related internal-control systems, used by operating officials in the day-to-day accomplishment of their assigned operation?

7 SEP 1995

IOCR 5-1

- o. Is work measurement data being used?
 - (1) In scheduling and controlling work?
 - (2) In forecasting and controlling resources?
 - (3) In cost estimating?
 - (4) In staffing requirements for current and projected workloads?
- p. Are cost savings attributable to work measurement being identified and reported, and can the savings be substantiated?
- q. Does the plant appear to have an adequate number of personnel covered by engineered standards?
- r. Does the type of standards mix appear to be reasonable?
- s. Are there enough and/or different types of workload to justify the number and type of job classifications/positions?